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8 Forms of Cancer Linked to a Virus Isolated in Humans

By JOHN A. OSMUNDSEN

A virus has been linked with eight human cancers in findings to be reported today by scientists at the Sloan-Kettering Institute for Cancer Research.

The virus was isolated from transplanted tumors of the mouth, muscle, ovary and other tissues, and from the non-cancerous livers and spleens of cancer patients, the report says.

Before today, the only human cancer reported to have been associated with a virus was leukemia, which affects the blood. Thus, the new report adds considerable weight to the growing speculation that a wide range of human cancers may be virus-caused.

Whether viruses have actually caused any of the human cancers with which they have been associated, however, is not yet known and will take considerably more research to determine.

Should it be found that viruses produce malignancy in humans as they have been found to do in many plants and animals, important avenues for attack on the disease would be opened.

It might be possible, for example, to develop vaccines for the prevention of cancer, possibly a single vaccine against several forms of the disease.

Also, should scientists find a way of combating virus diseases with drugs, cancer, too, would become vulnerable to chemotherapy.

Another possibility—and one that is more closely connected to the Sloan-Kettering findings—is that sensitive tests could be devised for detecting virus-caused tumors, which might otherwise escape notice until too late.

In a sense, one such cancer "test" is described in the report that appears in the September number of The Proceedings of the National Academy of Sciences. The "test" consists of the peculiar reaction that baby hamsters have to injections of the human cancer-virus.

Effect on Hamsters Cited

In the May 13 number of Science, Dr. Helene W. Toolan who is the senior author of the new report wrote that she and her colleagues had noted, quite accidentally, that baby hamsters injected with cell-free extracts of transplantable human tumors (ones that would "take" on laboratory animals) developed characteristics that resembled mongolism.

"It is characterized," she wrote, "by small size, flat face or microcephalic domed head, protruding eyes and tongue, abnormal teeth or absence of teeth, and bone fragility."

None of the other laboratory animals—rats and mice—developed the deformity, and it was the first time that such a condition had ever been observed in hamsters, according to the report.

Seen Under Microscope

Dr. Toolan found that the reaction could be produced by injections of cell-free extracts from the transplantable human tumors, from livers and spleens of cancer patients but not from the tumors growing in patients or from the tissues of normal persons.

Subsequent studies pointed more and more strongly to a virus or virus-like entity as the agent responsible for the bizarre response of the baby hamsters. Finally, the viruses were actually observed with the electron microscope as particles a little less than three-millionths of an inch across and completely unlike any other tumor virus yet observed, according to the new report.

The studies are continuing with the aim of answering other vitally important questions.

For example, there is a question whether human tumors will be found that are not associated with the newly discovered virus.

Human Tests Suggested

The virus was found in all eight of the transplanted human tumors tested at the time of the report, and Dr. Toolan said yesterday that this number had already risen to ten.

Another question the team is trying to answer is whether it will be possible to isolate viruses from a tumor growing in a patient.

An answer to the big question—whether the virus can be shown to produce a tumor—will no doubt be some time off. It probably will require injecting humans, or at least monkeys, with the tumor viruses.

Dr. Toolan pointed out yesterday that failure of the virus to produce tumors in the hamsters did not mean that the viruses were not capable of causing cancer in humans. This is because hamsters and humans are different animals. She noted also that a tumor virus that caused cancer in chickens produced a bleeding disease in rats.

The important factor is, she said, that a reproducable response can be elicited in experimental animals by injecting them with a substance that is known to be associated with cancer in humans.

Associated with Dr. Toolan in this work were Dr. Gilbert Dalldorf, Dr. Marion Barclay, Dr. Satish Chandra and Dr. Alice E. Moore.

Their work was supported by the American Cancer Society, the United States Public Health Service and the National Cancer Institute.

The Sloan-Kettering Institute for Cancer Research is one of the world's major centers dedicated to the search for the means of controlling cancer. Although the institute has long been associated with the screening of potentially useful chemicals with which to combat the disease, its work ranges into radiation and surgery and into the basic understanding of the complexities of human and animal biology both in the presence of cancer and otherwise.